

REMARKS

In the Office Action dated January 24, 2008, claims 1-12 and 14-17 were presented for examination. The Specification was objected to by the Examiner. Claims 7-11 were rejected under 35 U.S.C. §§101 and 112. Claims 1-4, 7-9, 12, 14, and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Ostergard*. Claims 5, 6, 10, 11, 16, and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Ostergard* in view of *Pardalos et al.*, in further view of *Szymanski*.

I. Rejections under 35 U.S.C. §§101 and 112

In the Office Action dated January 24, 2008, claims 7-11 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter and 35 U.S.C. §112, second paragraph as being indefinite.

More specifically, the Examiner alleges that the elements of claims 7-11 are directed to non-statutory subject matter as not reciting structure within the system. Applicant has amended claim 7 to specifically recite structural elements of the system. More specifically, the claims has been amended to include a graph with two or more vertices, and a clique returned with a group of interconnected nodes. The graph, vertices, counter, and clique are all structural elements within the system. The returned clique is a product formed within the system. As noted by the Examiner, in theory a counter can be a hardware element or a software element. However, claims 7-11 are drawn to a system, which is an apparatus claim. As such, the counter therein is a hardware element to calculate connectivity of each vertex. With respect to the rejection under 35 U.S.C. §112, second paragraph, Applicant has amended claims 7-11 to remove the method steps and direct the language of this group of claims to elements of a system. Accordingly, based upon the amendments to claims 7-11 presented herein, Applicant respectfully requests that the Examiner remove the rejections under 35 U.S.C. §§101 and 112, second paragraph, and grant an allowance of claims 7-11.

II. In the Specification

In the Office Action dated January 24, 2008, the Examiner objected to the Specification. Applicant has amended the Specification to clarify the objection raised by the Examiner. No new matter has been added to the application with the amendment presented herein, as the language emanates from original claim 13. Accordingly, Applicant respectfully requests that the Examiner remove the objection.

III. Rejection under 35 U.S.C. §112, first paragraph

In the Office Action dated January 24, 2008, the Examiner rejected claims 6, 11, and 17 under 35 U.S.C. §112, first paragraph. Applicant has canceled claims 6, 11, and 17 from further consideration. Accordingly, the rejection of these claims is now moot.

The Examiner has further rejected claims 1-12 and 14-17 under 35 U.S.C. §112, first paragraph. Applicant has amended the claims to further define and clarify how the interconnectivity is calculated and achieved. The amendments presented herein are based upon support in the original specification. Specifically, the term “connectivity count” is defined in the background, paragraph 0004, and the term “maximum connectivity” is defined in paragraph 0014. No new matter has been added to the application with the amendments presented herein. Furthermore, the amendments further define the invention with clarity. Accordingly, Applicant respectfully requests that the Examiner remove the rejection set forth under 35 U.S.C. §112, first paragraph, and grant an allowance of claims 1-5, 7-10, 12, and 14-16.

IV. Rejection of claims 1-4, 7-9, 12, 14, and 15 under 35 U.S.C. §103(a)

In the Office Action dated January 24, 2008, claims 1-4, 7-9, 12, 14, and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Ostergard*.

Applicant’s remarks to *Ostergard* in the prior communication are hereby incorporated by reference.

The Examiner employs *Ostergard* as a prior art reference in relation to a maximum clique algorithm disclosed by the Applicant. The algorithm described by *Ostergard* is based on searching for a maximum clique that contains a particular vertex. This particular vertex is removed and a search for a clique is performed in the subset of neighboring vertices. During the next iteration another vertex from the previous subset is removed and a search for a clique is conducted among the neighbors of the pruned vertex. The function $c(i)$ gives the largest clique in S_i ($S_i = \{v[i], v[i+1], \dots, v[n]\}$). More specifically, $c(i) = c(i+1)$ or $c(i) = c(i+1) + 1$ if there is a clique in S_i of size $c(i+1) + 1$ that includes vertex $v[i]$. See page 199-200, section 2.2.

In contrast, the invention of Applicant as reflected in the amended claims is based upon selecting a vertex with a least sum of said connectivity counts of all neighboring vertices (if multiple vertices have the same connectivity count) or a vertex with a least connectivity count, and then removing this selected vertex from a graph. The connectivity count of each vertex is updated in each iteration. See Fig. 2, step 48 of the Applicant's specification, as reflected in claim 2.

Accordingly, the vertices to be removed in the invention of *Ostergard* and the invention of the Applicant are chosen based on different principles. Applicant removes a vertex with the lowest connectivity count while *Ostergard* limits the search for a clique to a subset of vertices neighboring to a one selected vertex, i.e. pruning the remaining vertices. The method of the Applicant can search for any clique and not only a clique containing a particular vertex.

Ostergard pertains to an algorithm for finding a maximum clique in a graph. The term clique is defined by *Ostergard* as a set of vertices, any two of which are adjacent, and the term maximum clique is defined as the largest among all cliques in a graph.¹ *Ostergard* creates their graph based upon the number of vertices in the graph.² The pruning algorithm of *Ostergard*

¹See *Ostergard* page 1, Introduction paragraph, line 6.

²See *Ostergard* page 1, Introduction paragraph, line 7.

is based upon the premise of the number of vertices in the graph. In other words, *Ostergard* applies a pruning algorithm different than that of Applicant to create a graph of maximum interconnectivity whose members are all interconnected.

To establish a rejection under 35 U.S.C. §103(a), all the claim limitations must be taught or suggested in the prior art.³ If the prior art references do not teach or suggest every claim limitation of the Applicant's invention, then they do not meet every requirement under 35 U.S.C. §103(a) and are not sufficient to uphold a rejection under 35 U.S.C. §103(a).⁴ In the present case, as stated above, the invention claimed by Applicant employs a different algorithm than that of *Ostergard*. Therefore, because *Ostergard* does not teach or suggest utilizing the claimed algorithm of Applicant to create a maximum clique, the prior art reference does not teach every element of Applicant's claimed invention. Accordingly, the *Ostergard* reference is not sufficient to uphold a rejection under 35 U.S.C. §103(a).

V. Rejection of claims 5, 6, 10, 11, 16, and 17 under 35 U.S.C. §103(a)

In the Office Action dated January 24, 2008, claims 5, 6, 10, 11, 16, and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Ostergard* in view of *Pardalos et al.*, in further view of *Szymanski et al.*

Claims 6, 11, and 17 have been canceled. Accordingly, the rejection of these claims is now moot. The comments below pertain to remaining claims 5, 10, and 16.

Applicant's remarks pertaining to *Ostergard* from above are hereby incorporated by reference, together with Applicant's prior comments to *Ostergard*, *Pardalos et al.* and *Szymanski et al.*

³ MPEP §2143.03 (Citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)).

⁴ See MPEP §2143.

As noted in the prior communication, each of *Pardalos et al.* and *Szymanski et al.* do not teach application of the algorithm claimed by Applicant to the elements present in dependent claims 5, 10, and 16. To support the rejection set forth, claims 5, 10, and 16 each require the limitation of the associated independent claims. If the prior art references do not teach or suggest every claim limitation of the Applicant's invention, then they do not meet every requirement under 35 U.S.C. §103(a) and are not sufficient to uphold a rejection under 35 U.S.C. §103(a).⁵ In the present case, as stated above, one difference between Applicant's invention and *Ostergard* is that Applicant is applying a different algorithm than that provided for in *Ostergard*. Therefore, because *Ostergard* does not teach the claimed algorithm of Applicant to create a maximum clique, the prior art reference does not teach every element of Applicant's claimed invention. The *Ostergard* reference is not sufficient to uphold a rejection under 35 U.S.C. §103(a), and as such, the secondary references, which also lack the cited elements, in combination are also insufficient to uphold the rejection under 35 U.S.C. §103(a). Accordingly, Applicant respectfully requests that the Examiner remove the rejection and direct allowance of claims 5, 10, and 16.

VI. Conclusion

In view of the forgoing remarks to the claims, it is submitted that all of the claims remaining in the application are now in condition for allowance and such action is respectfully requested. Applicant is not conceding in this application that those claims in their prior forms are not patentable over the art cited by the Examiner, as the present claims are only for facilitating expeditious prosecution of the application. Applicant respectfully reserves the right to pursue these and other claims in one or more continuation and/or divisional patent applications. Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that she be contacted at the number indicated below.

⁵ See MPEP §2143.

For the reasons outlined above, an allowance of this application is respectfully requested.

Respectfully submitted,
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Date: June 24, 2008